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Apathy and anhedonia in adult and adolescent cannabis users and controls before and during the coronavirus lockdown

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Background: COVID-19 lockdown measures have caused significant disruptions to work and education, and have prevented people from participating in activities they normally find rewarding. Cannabis users might be especially vulnerable to adverse effects of lockdown and social isolation on motivation and hedonic capacity, due to putatively elevated levels of apathy and anhedonia. Additionally, due to the brain still being in development and to peer interaction being critical, adolescence may constitute a particularly vulnerable period for harmful effects of cannabis, as well as social isolation, placing adolescents at further risk. In the current study, we investigated apathy and anhedonia before and after lockdown measures were implemented, in a large sample of adult and adolescent cannabis users and controls. We hypothesised that cannabis users would have higher levels of apathy and anhedonia compared to controls, and a larger increase in levels since lockdown onset. We also hypothesised that the difference between users and controls would be larger for adolescents compared to adults.
Methods: A total of n=256 adult and n=200 adolescent cannabis users, and n=170 adult and n=172 adolescent controls participated in this online survey study, between June and August 2020. Apathy was measured with the Apathy Evaluation Scale (AES), and anhedonia was measured with the Snaith-Hamilton Pleasure Scale (SHAPS). Higher scores indicated greater levels of apathy and anhedonia, respectively. The Severity of Dependence Scale was used to assess cannabis dependence. Scores on the AES and SHAPS were investigated with separate mixed measures Analyses of Covariance, with factors User-Group, Age-Group, and Time. The Time*User-Group, Time*Age-Group, User-Group*Age-Group, and Time*User-Group*Age-Group interactions were also included. All models controlled for depression and anxiety, as well as alcohol, cigarette, and other illicit drug use.
Results: Adolescent cannabis users had significantly higher SHAPS scores before lockdown, compared to adolescent controls ($p=0.03$, $\eta_p^2=0.013$). After lockdown, conversely, adult users had significantly lower scores on both the SHAPS ($p<0.001$, $\eta_p^2=0.030$) and AES ($p<0.001$, $\eta_p^2=0.048$) compared to adult controls. Scores on both scales increased during lockdown across groups, and this increase was significantly smaller for cannabis users (AES $p=0.001$, $\eta_p^2=0.014$; SHAPS $p=0.01$, $\eta_p^2=0.008$). A total of n=130 adult and n=69 adolescent cannabis users were classified as dependent. Due to strong bivariate correlations between cannabis dependence and scores on the AES and SHAPS, we performed additional exploratory analyses within cannabis users, with factor Dependence in place of User-Group. Dependent cannabis users had significantly higher scores on both the AES ($p<0.001$, $\eta_p^2=0.037$) and SHAPS ($p<0.001$, $\eta_p^2=0.029$) compared to non-dependent users, and a larger increase in scores on both scales during lockdown (AES $p=0.04$, $\eta_p^2=0.010$; SHAPS $p=0.04$, $\eta_p^2=0.010$).
Conclusions: Our results suggest that adolescents and adults have differential associations between cannabis use, and apathy and anhedonia. Adolescent cannabis users appear to be at especially increased risk of anhedonia. We found no evidence of higher levels of apathy or anhedonia in adult users, compared to age-matched controls. Cannabis dependence may be associated with higher levels of apathy and anhedonia within users, regardless of age, and a greater increase in levels during the COVID-19 lockdown.

Conflict of interest
Disclosure statement:
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P.0287
Brief adaptive assessment of facial emotional bias using item response theory and decision regression trees

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Background: Biases in facial emotion recognition are observed in depression. Antidepressant medication alters performance in patients with depression, and better recognition of positive emotion after treatment initiation predicts longer-term outcomes [1]. Thus, sensitive measures of emotional bias which could be used alongside treatment initiation would a useful tool. Here we describe the application of Item Response Theory (IRT) and Decision Regression Trees (DRT) to model a brief, adaptive and abbreviated version of the CANTAB Emotional Bias Task (EBT).
Methods: 737 adult (>18 yrs) were recruited through Prolific (https://www.prolific.ac/) platform for web-based studies. In EBT, participants are briefly presented with 45 facial expressions from a 15-step morph sequence from happy to sad, and are asked judge which emotion they saw. The bias point indicates when a participant is equally likely to endorse either emotion.

This study consists of four distinct phases. First, IRT analysis was applied to normative data. We modelled two IRT parameters for each emotion morph (difficulty and discrimination), predicting participant latent emotional bias (theta).